

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A packet control unit (~~Ra, Rb, Rc, Rd;~~ PCU1-PCUn) for being included in a packet switched control network ~~[[PSCN]]~~ as one of a plurality of packet control units for controlling a packet traffic constituted by a plurality of packets (~~CP1-CPx~~) being routed between said plurality of packet control units along a plurality of packet routing links (~~PRL1-PRLm~~),

said packet switched control network ~~[[PSCN]]~~ being configured in such a way that said plurality of packet routing links (~~PRL1-PRLm~~) and said plurality of packet control units (~~Ra, Rb, PCU1-PCUn~~) respectively correspond to path sections (~~RDS1-RDSm~~) and path points (~~ICP1-ICPn~~) of an object movement network ~~[[RDN]]~~ in which an object traffic is formed by a plurality of objects (~~C1-Cx~~) moving along said path sections (~~RDS1-RDSm~~) between said path points (~~ICP1-ICPn~~), and

each path point (~~ICP1-ICPn~~) of said object movement network ~~[[RDN]]~~ having associated with it a traffic information unit (TIU) (~~TIU1-TIUy~~) adapted at least to detect the arrival of said plurality of objects (~~C1-Cx~~) at the path point (~~ICP1-ICPn~~) and to output a corresponding object arrival information (~~VAI1-VAIy~~), including

a transmission device ~~[[TR]]~~ adapted to send respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used

in said packet switched control network ~~[[PSCN]]~~ for the controlling of said packet traffic;

a reception device ~~[[REC]]~~ adapted to receive packets from other packet control units ~~(PCU1-PCUn)~~ of said packet switched control network ~~[[PSCN]]~~ and at least one object arrival information ~~(VA1-VAly)~~ indicating the arrival of ~~[[an]]~~ at least one object ~~(CR1-CRx)~~ at one of said path points ~~(Px; ICP1-ICPn)~~; and

a synchronisation device ~~[[SYNC]]~~ adapted to cause the sending of a packet corresponding to said at least one object to the a packet control unit ~~[[Rx]]~~ corresponding to a ~~said~~ path point ~~(Px)~~ at which the said at least one object arrival was detected by ~~[[its]]~~ an associated traffic information unit.

2. (Currently Amended) A packet control unit ~~(Rx; PCU1-PCUn)~~ for being included in a packet switched control network ~~[[PSCN]]~~ as one of a plurality of packet control units for controlling a packet traffic constituted by a plurality of packets ~~(CP1-CPx)~~ being routed between said plurality of packet control units along a plurality of packet routing links ~~(PRL1-PRLm)~~,

said packet switched control network ~~[[PSCN]]~~ being configured in such a way that said plurality of packet routing links ~~(PRL1-PRLm)~~ and said packet control units ~~(Ra, Rb; PCU1-PCUn)~~ respectively correspond to path sections ~~(RDS1-RDSm)~~ and path points ~~(ICP1-ICPn)~~ of an object movement network ~~[[RDN]]~~ in which an object traffic is formed by a plurality of objects ~~(C1-Cx)~~ moving along said path sections ~~(RDS1-RDSm)~~ between said path points ~~(ICP1-ICPn)~~, and

each path point ~~(ICP1-ICPn)~~ of said object movement network ~~[[RDN]]~~ having associated with it a traffic information unit ~~(TIU1-TIUy)~~ adapted at least to detect the arrival of said plurality of objects ~~(C1-Cx)~~ at the path point ~~(ICP1-ICPn)~~ and to output a corresponding object arrival information ~~(VA1-VAly)~~, including

a transmission device ~~[[TR]]~~ adapted to send respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network ~~[[PSCN]]~~ for the controlling of said packet traffic;

a reception device ~~[[REC]]~~ adapted to receive packets from other packet control units ~~(PCU1-PCUn)~~ of said packet switched control network ~~[[PSCN]]~~ and an object arrival information ~~(VA1-VAly)~~ indicating the arrival of ~~[[an]]~~ at least one object ~~(CR1-CRx)~~ at the path point ~~(Px; ICP1-ICPn)~~ corresponding to said packet control unit ~~[[Rx]]~~; and

a synchronisation device ~~[[SYNC]]~~ adapted to cause the sending of a packet corresponding to said at least one object to the said packet control unit ~~[[Rx]]~~ if a received object arrival information indicates the arrival of an object ~~(CR1-CRx)~~ at the path point ~~(Px; ICP1-ICPn)~~ corresponding to said packet control unit ~~[[Rx]]~~,

said reception device ~~[[REC]]~~ being also adapted to receive said sent packet corresponding to said at least one object.

3. (Currently Amended) A packet control unit ~~(Ra, Rb; PCU1-PCUn)~~ for being included in a packet switched control network ~~[[PSCN]]~~ as one of a plurality of packet control units for controlling a packet traffic constituted by a plurality of packets ~~(CP1-CPx)~~ being routed between said plurality of packet control units along a plurality of packet routing links ~~(PRL1-PRLm)~~,

said packet switched control network ~~[[PSCN]]~~ being configured in such a way that said plurality of packet routing links ~~(PRL1-PRLm)~~ and said plurality of packet control units ~~(Ra, Rb; PCU1-PCUn)~~ respectively correspond to path sections ~~(RDS1-RDSm)~~ and path points ~~(ICP1-ICPn)~~ of an object movement

network ~~[[(RDN)]]~~ in which an object traffic is formed by a plurality of objects ~~(C1-Cx)~~ moving along said path sections ~~(RDS1-RDSm)~~ between said path points ~~(ICP1-ICPn)~~, and

each path point ~~(ICP1-ICPn)~~ of said object movement network ~~[[(RDN)]]~~ having associated with it a traffic information unit ~~(TIU1-TIUy)~~ adapted at least to detect the arrival of said plurality of objects ~~(C1-Cx)~~ at the path point ~~(ICP1-ICPn)~~ and to output a corresponding object arrival information ~~(VAI1-VAIy)~~, including

a transmission device ~~[[(TR)]]~~ adapted to send respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network ~~[[(PSCN)]]~~ for the controlling of said packet traffic;

a reception device ~~[[(REC)]]~~ adapted to receive packets from other packet control units ~~(PCU1-PCUn)~~ of said packet switched control network ~~[[(PSCN)]]~~ and object arrival information ~~(VAI1-VAIy)~~ indicating the arrival of one or more objects ~~(CR1-CRx)~~ at one or more path points ~~(Px; ICP1-ICPn)~~; and

a synchronisation device ~~[[(SYNC)]]~~ adapted to delete a packet in said packet control unit ~~(Ra; Rb)~~ if an said object arrival information ~~(VAI1-VAIy)~~ indicating the arrival of an object corresponding to said packet at a path point ~~(Pb)~~ is not received within a predetermined time interval ~~(p1-p2)~~ by said reception device ~~[[(REC)]]~~.

4. (Currently Amended) A packet control unit ~~(Ra)~~ according to claim 1, wherein
characterized in that
said synchronisation device ~~[[(SYNC)]]~~ is adapted to cause said transmission device ~~[[(TR)]]~~ to send to said packet control unit ~~[[(Rx)]]~~ corresponding to said

path point $\{P_x\}$ at which the object arrival was detected, a packet stored at said one of said plurality of packet control units $\{Ra\}$ and to be transmitted to said target packet control unit $\{Rb\}$.

5. (Currently Amended) A packet control unit $\{Rb, PCU\}$ according to claim 2, wherein
~~characterized in that~~
said synchronisation device $[[SYNC]]$ is adapted to cause a transmission device $[[TR]]$ of another packet control unit $\{Ra\}$ corresponding to a path point $\{Pa\}$ from which said object has moved to the path point $\{Pb\}$ for which the object arrival has been detected, to send to said packet control unit $\{Rb\}$ corresponding to said path point $\{Pb\}$ at which the object arrival was detected, a packet stored at said another packet control unit $\{Ra\}$ and to be transmitted to said packet control unit $\{Rb\}$.

6. (Currently Amended) A packet control unit ~~$\{Ra\}$~~ according to claim 1, wherein
~~characterized in that~~
said synchronisation device $[[SYNC]]$ is adapted to cause said transmission device $[[TR]]$ to send to a ~~said~~ packet control unit $[[Rx]]$ corresponding to said path point $\{Px\}$ at which the object arrival was detected a copy of a packet stored at said packet control unit $\{Ra\}$ and sent to said target packet control unit $\{Rb\}$.

7. (Currently Amended) A packet control unit $\{Ra\}$ according to claim 1, wherein
~~characterized in that~~
said synchronisation device $[[SYNC]]$ is adapted to store a packet link information $[[PLI]]$ indicating the target packet control unit $\{Rb\}$ to which the packet has been sent by said transmission device $[[TR]]$ wherein said synchronisation device $[[SYNC]]$ is adapted to cause the target packet control unit $\{Rb\}$ identified by the stored packet link information $[[PLI]]$ to send the

packet to the packet control unit ~~[[R_x]]~~ corresponding to said path point ~~(P_x)~~ at which the object arrival was detected.

8. (Currently Amended) A packet control unit ~~(R_a)~~ according to claim 1, wherein

~~characterized in that~~

said synchronisation device ~~(R_a)~~, upon receipt of said object arrival information, is adapted to broadcast to all ~~[[its]]~~ adjacent packet control units ~~(R_b, R_c)~~ a packet search request ~~(P_{FWD})~~ to cause said target packet control unit (R_b) to send a packet to the packet control unit ~~[[R_x]]~~ corresponding to said path point ~~(P_x)~~ at which the object arrival was detected.

9. (Currently Amended) A packet control unit ~~(R_a)~~ according to claim 3, wherein

~~characterized in that~~

when said transmission device ~~[[TR]]~~ of said packet control unit ~~(R_a)~~ plans to send a packet to said packet control unit's ~~[[its]]~~ succeeding target packet control unit ~~(R_b)~~ and no object arrival information for an object corresponding to this packet is generated from the traffic information unit at the path point ~~(P_b)~~ corresponding to the target packet control unit ~~(R_b)~~ or any other packet control unit ~~(e.g. R_x)~~ within said predetermined time interval, said synchronisation device ~~[[SYNC]]~~ is adapted cause a deletion device ~~(DEL)~~ to cancel said packet before said transmission device ~~[[TR]]~~ sends it to said target packet control unit ~~(R_b)~~.

10. (Currently Amended) A packet control unit ~~[[R_x]]~~ according to claim 1, wherein

~~characterized in that~~

said synchronisation device ~~[[SYNC]]~~ is adapted to cause a generation device ~~(GEN)~~ to generate a new packet and to cause said transmission device ~~[[TR]]~~ to send to said packet control unit ~~(R_b)~~ corresponding to said path point ~~(P_b)~~ at which the object arrival was detected said newly generated packet.

11. A traffic management system (~~TMSYS~~) for managing in a network ~~[[[RDN]]]~~ the object traffic formed, on a physical layer (~~PL~~), by

a1) a plurality of objects (~~G1-Gx~~) moving along

a2) a plurality of path sections (~~RDS1-RDSm~~) of the network ~~[[[RDN]]]~~ and

a3) a plurality of path points (~~ICP1-ICPn~~) located at said path sections (~~RDS1-RDSm~~) of the network ~~[[[RDN]]]~~, and

a4) each path point (~~ICP1-ICPn~~) having associated with it a traffic information unit (~~TIU1-TIUy~~) adapted at least to detect the arrival of objects (~~G1-Gx~~) at the respective path point (~~ICP1-ICPn~~) and to output a corresponding object arrival information (~~VAI1-VAIy~~), comprising:

a packet switched control network ~~[[[PSCN]]]~~ on a traffic control layer (TCL) in which the packet traffic is constituted by

b1) a plurality of packets (~~CP1-CPx~~) being routed along

b2) a plurality of packet routing links (~~PRL1-PRLm~~) is controlled by

b3) a plurality of packet control units (~~PCU1-PCUn~~) located at said packet routing links (~~PRL1-PRLm~~) for controlling the packet traffic in said packet switched control network ~~[[[PSCN]]]~~ such that each packet (~~CP1-CPx~~) routed along a respective packet routing link (~~PRL1-PRLm~~) corresponds to one object (~~CR1-CRx~~) moving on a corresponding path section (~~RDS1-RDSm~~);

b4) each packet control unit being ~~constituted as defined in claim 1 or claim 2 or claim 3 and being~~ adapted to send, with the respective transmission device

[[(TR)]], as a source packet control unit respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network [[(PSCN)]], for the controlling of said packet traffic;

wherein said packet switched control network [[(PSCN)]], on the traffic control layer (TCL) is configured in such a way that

c1) packet routing links ~~(PRL1-PRLm)~~ correspond to path sections ~~(RDS1-RDSm)~~; and

c2) packet control units ~~(PCU1-PCUn)~~ correspond to path points ~~(ICP1-ICPn)~~; wherein

c3) when a traffic information unit ~~(e.g. TIU1)~~ detects the arrival of an object ~~(C1-Cx)~~ at its associated path point ~~(e.g. Px)~~ and outputs a corresponding object arrival information ~~(VAI1-VAIy)~~, and

an arrival packet control unit ~~(e.g. Rx)~~ corresponding to said path point ~~(Px)~~ does not detect the arrival of a packet corresponding to said object,

a synchronisation packet control unit ~~(e.g. Ra)~~ is adapted to send a packet corresponding to said object to said arrival packet control unit ~~[[(Rx)]]~~ to synchronize the packet routing and the object movement.

12. (Currently Amended) A system according to claim 11, wherein ~~characterized in that~~

said traffic information units ~~(TIU1-TIUy)~~ are also adapted to guide an object onto a path section to a succeeding path point corresponding to a target packet

control unit determined by the source packet control unit in accordance with said routing decision.

13. (Currently Amended) A system according to claim 11 including at least one packet control unit ~~constituted as defined in claim 8,~~ characterized in that

wherein

said packet search request ~~(PFWD)~~ is constituted by a search packet ~~[[SP]]~~ sent to said adjacent packet control units.

14. (Currently Amended) A system according to claim 13, wherein characterized in that

said search packet ~~[[SP]]~~ comprises a life time field indicating the life time of said search packet ~~[[SP]]~~ wherein said adjacent packet control units comprise a deletion device ~~[[DEL]]~~ adapted to delete said search packet ~~[[SP]]~~ if the life time field indicates a life time exceeding a maximum allowable life time.

15. (Currently Amended) A method for managing in a network ~~[[RDN]]~~ the object traffic formed, on a physical layer ~~[[PL]]~~, by

a1) a plurality of objects ~~(C1-Cx)~~ moving along

a2) a plurality of path sections ~~(RDS1-RDSm)~~ of the network ~~[[RDN]]~~ and

a3) a plurality of path points ~~(ICP1-ICPn)~~ located at said path sections ~~(RDS1-RDSm)~~ of the network ~~[[RDN]]~~,

a4) each path point ~~(ICP1-ICPn)~~ having associated with it a traffic information unit ~~(TIU1-TIUy)~~ adapted at least to detect the arrival of objects ~~(C1-Cx)~~ at the respective path point ~~(ICP1-ICPn)~~ and to output a corresponding object arrival information ~~(VAI1-VAIy)~~,

by controlling in a packet switched control network ~~[[PSCN]]~~ on a traffic control layer (TCL) the packet traffic constituted by

- b1) a plurality of packets ~~(CP1-CPx)~~ being routed along
- b2) a plurality of packet routing links ~~(PRL1-PRLm)~~ by means of
- b3) a plurality of packet control units ~~(PCU1-PCUn)~~ located at said packet routing links ~~(PRL1-PRLm)~~;
- b4) each packet control unit being adapted to send as a source packet control unit respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network ~~[[PSCN]]~~ for the controlling of said packet traffic;

wherein said packet switched control network ~~[[PSCN]]~~ on the traffic control layer (TCL) is configured in such a way that

- c1) packet routing links ~~(PRL1-PRLm)~~ correspond to path sections ~~(RDS1-RDSm)~~; and
- c2) packet control units ~~(PCU1-PCUn)~~ correspond to path points ~~(ICP1-ICPn)~~; and wherein said controlling of said packet control unit is performed in such a way that
- c3) each packet ~~(CP1-CPx)~~ routed along a respective packet routing link ~~(PRL1-PRLm)~~ corresponds to one object ~~(CR1-CRx)~~ moving on a corresponding path section ~~(RDS1-RDSm)~~; comprising the following steps:

detecting an object arrival at one of said path points ~~(Px; ICP1-ICPn)~~ and generating a corresponding object arrival information ~~(VAI1-VAIy)~~; and

causing a packet control unit to send a packet corresponding to said object to the packet control unit ~~[(Px)]~~ corresponding to said path point ~~(Px)~~ at which the object arrival was detected.